

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

--	--	--	--	--	--	--	--	--	--

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2017/2018

PBM0054 – MATHEMATICS

(Foundation in Business)

4 JUNE 2018

2.30 p.m. – 4.30 p.m.

(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of 2 pages with **FIVE** questions.
2. Attempt **ALL** five questions. The distribution of the marks for each question is given.
3. Please write all your answers in the answer booklet provided. All necessary workings **MUST** be shown.

Question 1

a. Simplify $\left(\frac{3y^{-1} + 4x^{-1}}{9y^{-2} - 16x^{-2}}\right)(27x^3 - 64y^3)$. (8 marks)

b. Simplify $\frac{[h^4 j^{-1} k^4]^3}{(2h^{-3} j^{-4} k^{-2})^{-2}}$. (4 marks)

c. Solve $\sqrt{17y - \sqrt{y^2 - 5}} = 7$. (8 marks)

d. Find an equation of the line L_1 that passes through the point $(3, -7)$ which is perpendicular to the line that contains the points $\left(\frac{1}{2}, 3\right)$ and $(5, 0)$. (5 marks)

(Total = 25 marks)

Question 2

Solve for x of the following equations.

a. $\log 4x^4 - 2\log 2x = \log(x + 2)$ (7 marks)

b. $\frac{4000}{2 + 7^{3x}} = 5$ (5 marks)

(Total = 12 marks)

Question 3

Solve the following system of linear equations using the inverse of coefficient matrix.

$$x + y + z - 6 = 0$$

$$2y + 5z + 4 = 0$$

$$2x + 5y - z - 27 = 0$$

(13 marks)

(Total = 13 marks)

Continued...

Question 4

- a. Find $\frac{dy}{dx}$ for the following functions and simplify the answers.

i. $y = 8x^9 - \frac{2}{15x^6} + \frac{3}{\sqrt[3]{x^4}} - 12$ (3 marks)

ii. $y = 4\left(\frac{1}{6}x^4 + 5x^{-2} - 2\right)^{-3/2}$ (3 marks)

iii. $y = (5x^2 - 1)(-x^2 - 3)^4$ (5 marks)

iv. $y = \frac{(x^3 + 4)^3}{3x^4 - 2}$ (5 marks)

- b. Given that $f(x) = (4x + p)(x + 3)^2$, where p is a constant, find the value of p if $f'\left(\frac{1}{2}\right) = 13$. (4 marks)

- c. If $w = (5x + 6)^3$ and $x = \frac{s+1}{s-1}$, find $\frac{dw}{ds}$. (5 marks)

(Total = 25 marks)

Question 5

- a. Integrate each of the following integral.

i. $\int x^{\frac{3}{2}} \left(-\frac{2}{3}x^3 + \frac{1}{x} \right) dx$ (3 marks)

ii. $\int_0^2 \frac{x}{\sqrt{5x^2 + 4}} dx$ (6 marks)

iii. $\int 16x(\sqrt{(2x+5)(2x-5)}) dx$ (6 marks)

- b. Given $\int_0^1 k(9 - x^2) dx = \frac{1}{12} + k$, find the value of constant k . (3 marks)

- c. The marginal price for a weekly demand of x bottles of shampoo in a store is given by

$$P'(x) = \frac{-6000}{(3x + 50)^2}.$$

Find the price-demand equation, $P(x)$ if the weekly demand is 150 when the price of a bottle of shampoo is RM8.00. (7 marks)

(Total = 25 marks)

End of page